

## **HAEMATOLOGICAL PROFILE AND PRODUCTIVE PERFORMANCE OF FRIZZLE FOWL REARED IN SUBTROPICAL CLIMATIC CONDITION OF ASSAM**

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### **ABSTRACT**

Lakhimpur district is one of the agriculture producing districts of Assam. However, the area is experienced with a high rainfall, temperature and relative humidity. The farm animal species including poultry reared in this district is well adapted to the prevailing subtropical climatic condition. An experiment was designed to survey the productive and reproductive performance as well as normal haematological parameters of frizzle fowl reared in this district. It was observed that the birds were reared in backyard system with little or no supplementation of feed. The productive and reproductive performances were comparable to other indigenous breeds of poultry. Further the present survey also revealed that the average body weight of cockerel and hen were  $1.55 \pm 0.26$  and  $1.08 \pm 0.51$  kg respectively. From the experiment it was observed that the most of the haematological parameters did not differ with other indigenous breed of poultry.

**KEYWORDS:** Climate, Fowl, Frizzle, Haematology, Hatchability

### **INTRODUCTION**

Assam has a sub-tropical monsoon climate with an average rainfall of around 1,500 mm per year. The daytime temperature in summer and rainy season, rises to around 35°C and in winter cools to 25°C with a nighttime minimum of around 10°C. The North bank plain zone of Assam especially Lakhimpur district is one of the agrarian district of Assam where agriculture and animal husbandry go hand to hand. The animals as well as poultry reared in this district experience a variable climatic condition of the year. The main poultry indigenous breed preferred to rear in this climate is Miri, Chittagong, Titr and Teni that were originated from different parts of India.

The Frizzle is a breed of chicken with characteristic curled or frizzled plumage. The origin of the Frizzle is unknown and the frizzle gene is thought to have originated in Asia. This breed is mostly preferred to rear in the coastal climatic condition of India also available on high altitudes hilly tracts of North-Eastern states. It is said that birds have better adaptability to the hot and humid climatic conditions. This breed is one of the preferred poultry reared in Lakhimpur district of Assam. However, meager literature is available regarding the rearing of this breed in the rest five agroclimatic zones of Assam. Further, there is limited information concerning the normal blood profiles of frizzle fowl of varying age in different husbandry regimens. It is important to study the haematological as well as blood profiles that can be used as a diagnostic tool to assess the health status of an individual and / or a flock (Tras *et al.*, 2000). Haematological changes are routinely used to determine various influences of nutritional, environmental and / or pathological factors (Garacyk *et al.*, 2003). Avian blood differs in cell characteristics from their mammalian counterparts (Smith *et al.*, 2000). Such information apart from being useful for diagnostic and management purposes could equally be incorporated into breeding programmes

for genetic improvement (Kral *et al.* 2000). Therefore an experiment was designed to survey the productive and reproductive as well as laboratory analysis normal haematological parameters of frizzle fowl reared in this district to generate some baseline data.

## MATERIAL AND METHODS

For the present experiment Lakhimpur district of Assam was selected as the representative of North bank plain agroclimatic zone of Assam. As it is said to be that highest population of Frizzle fowl is reared in this agroclimatic zone of Assam. The comparative survey was conducted among the poultry farmers of adjoining areas of North Lakhimpur namely, Joyhing, Lilabari, Rangajan, Saboti and Ghunasuti to generate baseline data on rearing system, reproductive performances and haematological parameters of Frizzle fowl reared in the proposed area. Reproductive and productive performances were recorded through survey using standard questionnaire from randomly selected farmers.

### Blood Collection

Blood samples (n=63) from each bird were collected randomly with a sterile syringe and needle (23 gauge) from the wing vein or otherwise collected from slaughtered birds at local abattoirs. The collected blood was dispensed into tubes containing anticoagulant EDTA (ethylene diamine tetra acetic acid). The anticoagulated blood was used to determine red blood cell (RBC), white blood cell (WBC) count, packet cell volume (PVC), haemoglobin (Hb) concentration and mean corpuscular volume (MCV).

RBC and WBC were counted by using the improved Neubauer haemocytometer, as described by Dacie and Lewis, 1991; PCV and Hb concentration were determined by using the microhaematocrit and haemometer Sahlis method, respectively. The values of MCV were determined using the appropriate formulae (Jain 1986) and differential leukocyte count (DLC) was estimated by using Wright-Giemsa stain as per standard method (Schalm 1986). Body weight of birds was recorded on the farmer's field. The data obtained were analyzed using standard statistical methods (Snedecor and Cochran, 1994).

## RESULTS AND DISCUSSIONS

The traditional backyard system of rearing is mostly practiced in the district for maintaining the Frizzle fowls with little scientific intervention. They prefer the housing of birds prepared with locally available low cost housing materials like bamboo, thatch grass etc. They prepare poultry houses for night shelter along with the houses made for other livestock like cattle and goat (41%) or beneath the house made for storage of rice (47%). In some cases birds share same house along with owner for night shelter (12%). The management system followed by the farmers is free range system with nighttime shelter. The feeding system is exclusively scavenging type except few where broken rice and rice brans were offered at late hour of the day. Further, our survey also revealed that the average body weight for cockerel and hen were  $1.55 \pm 0.26$  and  $1.08 \pm 0.51$ kg respectively (Table 2). The average age at first laying were  $175 \pm 2.51$  days with an average egg weight of  $44.2 \pm 1.03$ g at ten weeks of egg laying. The average clutch per year was  $6.2 \pm 0.43$  and on an average  $8.1 \pm 0.23$  eggs were laid per hens per clutch and having the tendency to brood the laid eggs. The hatchability is recorded  $70.2 \pm 0.45$  percent. The broodiness behavior of local poultry may be the main hindrance of lower egg production. It was observed that the farmers prefer to hatch the eggs for chick production in September to November and February to March of the year as the farmers observed higher hatchability during these months of the year. This might be due to availability of food grains for the birds as the farmers harvest the rice and other cereal grain products that provide a wide source of feed for the birds in

the paddy fields. The value of egg production and hatchability recorded in the present study was lower than  $13.64 \pm 2.31$  per clutch and  $76.13 \pm 3.11$  in frizzle fowl reared by semi-intensive system of rearing (Subalini and Thanuejan, 2014). This may be due to the variation in natural availability and composition of feeds accessed by the birds in its environment. Further, the nutrition directly affects the reproductive phenomenon, and has the potential to moderate the effects of other factors (Smith and Akinbamijo, 2000). The body weight and egg production as well as reproductive performance in terms of number of eggs hatched might be within the normal range as per the available nutrients in backyard system of rearing.

**Table 1: Mean Haematological Values for Frizzle Fowl**

PCV (%)	RBC ( $\times 10^6/\text{m l}$ )	WBC ( $\times 10^3/\text{ml}$ )	Hb (g/dL)	MCV (fl)	DLC (%)			
					Eosinophil	Basophil	Lymphocytes	Monocytes
$32.12 \pm 0.57$	$4.38 \pm 2.13$	$4.10 \pm 5.30$	$14.43 \pm 0.70$	$81.60 \pm 1.63$	$8.67 \pm 0.60$	$2.33 \pm 0.45$	$39.167 \pm 1.77$	$6.66 \pm 0.43$

The haematological parameters of frizzle fowls reared in the area of were presented in Table 1. The PCV values recorded in the present study is lower than the PCV values recorded for Nigerian Naked neck ( $41.0 \pm 1.16$ ) and normally feathered ( $35.90 \pm 1.16$ ) poultry (Ladokun *et al.* 2008). The number of RBC recorded in the present study was within the range as recorded in chickens ( $242.60 \pm 2.13$  mm) (Addass *et al.* 2012) reared by semi-intensive system of rearing. The value of Hb in the present study is higher than the reported  $13.5 \pm 0.7$  g/dl in *Gallus gallus domesticus* (Bhure *et al.* 2011) might be due to difference in species. Further nutritional status and rearing system of the poultry might influence Hb concentration because of accessibility of various kind of feed stuffs including insects, worms etc in backyard system. The WBC, MCV and DLC counted in the present experiment were within the range of healthy chickens and Japanese Quails (Deka and Borah 2008).

**Table 2: Productive and Reproductive Performances of Frizzle Fowl Reared Backyard System**

Characteristics	Observations
Number of clutch/ year	$6.2 \pm 0.43$ (No)
Egg production/ clutch	$8.1 \pm 0.23$ (No)
Annual egg production	$52.25 \pm 2.80$ (No)
Average body weight of cockerel	$1.55 \pm 0.26$ (Kg)
Average body weight of hen	$1.08 \pm 0.51$ (Kg)
Average weight at first laying	$178.0 \pm 2.51$ days
Average egg weight	$45.2 \pm 1.03$ g
Hatchability	$70.2 \pm 0.45\%$

The present study was conducted to generate normal haematological values of frizzle fowl reared in subtropical climatic condition of North bank plain zone of Assam specially Lakhimpur district. From the study it was observed that the fowls are reared mostly in backyard system of management with little scientific intervention in respect of health care, feeding and shelter management. However, it was observed that the haematological parameters, productive performance in terms of body weight as well as reproductive performance in terms of egg production and hatchability of eggs is comparable to other indigenous poultry. The data generated from the study might be first for frizzle fowl reared in this district of Assam which will provide a scope for further study of this breed in this region.

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